AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Currently Amended) A pattern inspection method which scans an [[the]] inspected pattern formed on a substrate according to [[the]] design data with a [[the]] laser beam and receives [[the]] light passed through said substrate with [[the]] a light receiving device and, from [[the]] pattern information obtained by said light receiving device, generates [[the]] an image of the inspected pattern and, for coincidence between this image and [[the]] reference data obtained by imaging of said design data, corrects said reference data to generate [[the]] a reference image and compares the image of said inspected pattern and the reference image to detect any defects of the inspected pattern wherein,

said reference image generation comprising:

~~determining an edge boundary condition showing a grey level value corresponding to the edge position of an optical point spread function corresponding to the laser beam shape;~~

provision to each pixel of sub-pixels dividing the pixel to form a matrix and calculation of [[the]] a gray level of the pixel based on the number of sub-pixels belonging to [[the]] a pattern developed in each pixel,

calculation of [[the]] a pattern width ~~for said inspected pattern and~~ for the reference data ~~at the corresponding position~~ by treating [[the]] a number obtained by dividing said gray level by [[the]] a gray level step count as the width of the pattern developed in that pixel,

determination of an edge boundary condition showing the gray level corresponding to the pattern edge position through convolution operation of an optical point spread function corresponding to a strength of the laser beam and said inspected pattern image.

detection of the edge position in said inspected pattern by the unit of sub-pixels according to said edge boundary condition,

calculation of the pattern width for said inspected pattern according to the detected edge position, and

calculation of the correction width of the pattern width for said reference data in the unit of sub-pixels from the difference between the pattern width of said inspected pattern and the pattern width of the reference data.

3. (Currently Amended) The [[A]] reference image preparation method as set forth in claim 2 wherein

~~the gray level of each pixel is calculated from the number of sub-pixels belonging to said inspected pattern and, treating the count obtained by dividing this gray level by the gray level step count as the pattern width of the inspected pattern developed in the pixel, the pattern width of said inspected pattern is calculated and~~

the gray level of each pixel in the reference data is calculated from the number of sub-pixels belonging to said reference data pattern and, treating [[the]] a count obtained by dividing this gray level by the gray level step count as the pattern width of the reference data developed in the pixel, ~~the pattern width of said reference data is calculated~~

the pattern width of the inspected pattern is calculated based on the pattern length in the unit of sub-pixels between two detected edge positions.

4. (Currently Amended) The [[A]] reference image preparation method as set forth in claim [[3]] 2 wherein

the pattern ~~correction~~ width for [[of]] said reference data is corrected by correcting the edge position of the said reference data according to the correction width ~~calculated from the difference between the pattern width of said inspected pattern and the pattern width of the reference data~~.

5. (Canceled)

6. (Currently Amended) A pattern inspection device comprising:

a scanning means which scans [[the]] an inspected pattern formed on the substrate according to [[the]] design data with [[the]] a laser beam and receives [[the]] light passing through said substrate with [[the]] a light receiving device[[,]];

a photoelectric image processing means which generates [[the]] an image of the inspected pattern from [[the]] pattern information obtained by the light receiving device in said scanning means[[,]];

~~edge position detection means for detecting the edge position of the detected image;~~

a reference image generation means which generates [[the]] a reference image [[with]] by correcting said reference data so that [[the]] positions of the image of said inspected pattern and the reference data obtained by imaging of said design data coincide[[,]];

a comparison means which compares the image of said inspected pattern and the reference image to detect any defect in the inspected pattern, [[and]]

a first pattern width calculation means which provides each pixel with sub-pixels dividing the pixel into a matrix and calculates the gray level of each pixel based on the number of sub-pixels belonging to [[the]] a pattern developed in each pixel and, with treating the count obtained by dividing this gray level by the gray level step count as the width of the pattern developed in the pixel, calculates ~~the pattern width of said inspected pattern and~~ the pattern width of the reference data ~~at the corresponding position respectively~~;

an edge position detection means which determines an edge boundary condition showing the gray level corresponding to a pattern edge position through convolution operation of an optical point spread function corresponding to a strength of the laser beam strength and the image of said inspected pattern and detects an edge position of the inspected pattern by the unit of sub-pixels according to said edge boundary condition;

a second pattern width calculation means which calculates the pattern width of said inspected pattern according to the detected edge position; and

a correction width calculation means which calculates a correction width of the pattern width for said reference data in the unit of sub-pixels from the difference between the pattern width of said inspected pattern and the pattern width of the reference data.

7. (Currently Amended) The [[A]] pattern inspection device as set forth in claim 6 wherein

said first pattern width calculation means

~~calculates the gray level of each pixel from the number of sub-pixels belonging to said inspected pattern and, with treating the count obtained by dividing this gray level by the gray level step count as the pattern width of the inspected pattern developed in the pixel, calculate the pattern width of said inspected pattern, and also~~ calculates the gray level of each pixel in the reference data from [[the]] a number of sub-pixels belonging to the pattern of said reference data and, with treating [[the]] a count obtained by dividing this gray level by the gray level step count as the pattern width of the reference data developed in the pixel, ~~calculates the pattern width of said reference data~~ and wherein

said second pattern width calculation means calculates the pattern width of the inspected pattern based on the pattern length in the unit of sub-pixels between two detected edge positions.

8. (Currently Amended) The [[A]] pattern inspection device as set forth in claim 6 [[7]] wherein

said first pattern width calculation means

~~calculates~~ corrects the pattern ~~correction~~ width for [[of]] said reference data by correcting the edge position of the ~~from the difference between the pattern width~~

~~of~~ said ~~inspected pattern and the pattern width of the~~ reference data according to the correction width.

9. (Canceled)

10. (Currently Amended) A computer readable memory storing a pattern inspection program which, by controlling the computer, scans the inspected pattern formed on the substrate according to the design data using the laser beam, receives the light passing from said substrate with the light receiving device, generates the image of the inspected pattern based on the pattern information obtained by the light receiving device and, for position coincidence between this image and the reference data obtained by imaging of said design data, corrects said reference data and generates the reference image, and compares the image of said inspected pattern and the reference image to detect defects of the inspected pattern wherein

said pattern inspection program executes,

in said reference image generation,

provision of sub-pixels dividing the pixel as a matrix to each pixel and calculation of [[the]] a gray level for each pixel based on the number of sub-pixels belonging to [[the]] a pattern developed in each pixel, [[an]]

calculation of [[the]] a pattern width for ~~of said inspected pattern and the pattern width of~~ the reference data by ~~at the corresponding position respectively with~~ treating [[the]] a number ~~count~~ obtained by dividing said gray level by [[the]] a gray level step count as the width of the pattern developed in that [[the]] pixel, ~~determining an edge boundary condition showing a grey level value corresponding to the edge position of an optical point spread function corresponding to the laser beam shape~~

determination of an edge boundary condition showing the gray level corresponding to the pattern edge position through convolution operation of an optical point spread function corresponding to a strength of the laser beam and said inspected pattern image.

detection of the edge position of said inspected pattern by the unit of sub-pixels according to said edge boundary condition,

calculation of the pattern width for said inspected pattern according to the detected edge position, and

calculation of the correction width of the pattern width for said reference data in the unit of sub-pixels from the difference between the pattern width of said inspected pattern and the pattern width of the reference data.

11. (Currently Amended) The [[A]] computer readable memory storing the pattern inspection program as set forth in claim 10 wherein

said pattern inspection program

~~calculates the gray level of each pixel from the number of sub-pixels belonging to said inspected pattern and, with treating the count obtained by dividing this gray level by the gray level step count as the pattern width of the inspected pattern developed in the pixel, calculates the pattern width of said inspected pattern, and also~~ calculates the gray level of each pixel from the number of sub-pixels belonging to the pattern of said reference data and, with treating [[the]] a count obtained by dividing this gray level by the gray level step count as the pattern width of the reference data developed in the pixel, calculates the pattern width of said reference data, and

calculates the pattern width of the inspected pattern based on the pattern length in the unit of sub-pixels between two detected edge positions.

12. (Currently Amended) The [[A]] computer readable memory storing the pattern inspection program as set forth in claim 10 [[11]] wherein

said pattern inspection program

corrects ~~calculates~~ the pattern ~~correction~~ width for [[of]] said reference data by correcting the edge position of the ~~from the difference between the pattern width of~~ said ~~inspected pattern and the pattern width of the~~ reference data according to the correction width.